NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Activity 7.1A: Simulation

Baseball player Tony Gwynn had a batting average of 0.350 for his career (think of it as a percentage). We want to simulate at bats for Tony. Answer the beginning questions, and then go on to perform the experiment.

## Beginning Questions

1. What is the probability that Tony gets a hit in any one at bat?
2. If Tony goes up to bat 20 times, what is the expected **number** of hits that he gets?
3. If Tony goes up to bat 20 times, what is the expected **percent** of hits that he gets?

**THE EXPERIMENT- Directions:**

* We want to use our calculator to help **SIMULATE** at bats. You will do this by using your calculator to generate random integers.
* The integers must represent our outcomes (hit or miss), and the probabilities must work too. So we need to have 35% of our numbers be hits, and 65% be misses
* The easiest way to do this is to generate random numbers from 1 to 100. Let integers 1 thru 35 be hits (35%), and the rest (36 – 100) be non-hits (65%)
* You generate numbers by doing randInt(1,100) and hitting ENTER. (reminder: randInt can be found under MATH 🡪 PRB).
* Generate the random numbers ONE AT A TIME and record them on the recording sheet attached. After each number, calculate the percent of hits.
* Simulate 50 at bats.
* Create a line graph on the page attached. Do this by recording the total percentage of hits after each trial, and connecting these points with a line
* Record your total number of hits (after 50 trials) and your percent on the board.
* Answer the follow-up questions

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# Follow Up Questions

1. A run is a repetition of the same result. For example, getting 5 hits in a row is a run of 5. Look at your chart of 50 trials. For your simulation, what was Tony Gwyn’s longest hitting streak?
2. What was his longest slump (misses)?
3. Look at your line graph. This defines the idea of RANDOM. Explain how this shows the definition of random (definition in the book, p. 315, to help you compare)
4. What was the percent of hits for your 50 at bats? Is this close to the true percent?
5. What was the overall, total percent of hits for the class? Is this close to the true percent? Which was closer- yours or the class’?
6. Create a histogram of the class data (the % hits) below. Mark 35% on the histogram. Describe shape, center and spread.

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Trial** | **Outcome** | **# of hits** | **% hits (# hits/total trials)** |  | **Trial** | **Outcome** | **# of hits** | **% hits** |
| **1** |  |  |  |  | **41** |  |  |  |
| **2** |  |  |  |  | **42** |  |  |  |
| **3** |  |  |  |  | **43** |  |  |  |
| **4** |  |  |  |  | **44** |  |  |  |
| **5** |  |  |  |  | **45** |  |  |  |
| **6** |  |  |  |  | **46** |  |  |  |
| **7** |  |  |  |  | **47** |  |  |  |
| **8** |  |  |  |  | **48** |  |  |  |
| **9** |  |  |  |  | **49** |  |  |  |
| **10** |  |  |  |  | **50** |  |  |  |
| **11** |  |  |  |  |  |  |  |  |
| **12** |  |  |  |  |  |  |  |  |
| **13** |  |  |  |  | Your total hits: \_\_\_\_\_\_\_\_\_\_\_  Your total % hits: \_\_\_\_\_\_\_\_\_\_/50 = \_\_\_\_\_\_\_\_\_\_\_%  Class total hits: \_\_\_\_\_\_\_\_\_\_\_  Class total % hits: \_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_ =  \_\_\_\_\_\_\_\_\_%  Now put the class percents into your calculator in L1 |  |  |  |
| **14** |  |  |  |  |  |  |  |  |
| **15** |  |  |  |  |  |  |  |  |
| **16** |  |  |  |  |  |  |  |  |
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| **18** |  |  |  |  |  |  |  |  |
| **19** |  |  |  |  |  |  |  |  |
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| **35** |  |  |  |  |  |  |  |  |
| **36** |  |  |  |  |  |  |  |  |
| **37** |  |  |  |  |  |  |  |  |
| **38** |  |  |  |  |  |  |  |  |
| **39** |  |  |  |  |  |  |  |  |
| **40** |  |  |  |  |  |  |  |  |

**LINE GRAPH**